

CLAIMS

1. Apparatus for the interstitial coagulation of tissues, with at least one electrode (10) by way of which a HF coagulation current can be conducted into the tissue, wherein the electrode (10) is constructed as a three-dimensional body that can be expanded to various states of expansion, or is attached to such a body (14), so that by continuous or stepwise expansion of the body (10, 14) the electrode (10) can be kept in constant electrical contact with the tissue during coagulation.
2. Apparatus according to Claim 1, characterized in that a control device (3) is provided for controlling the state of expansion of the body (10, 14) in dependence on the coagulation current.
3. Apparatus according to one of the preceding claims, in particular according to Claim 2, characterized in that the control device (3) is disposed and constructed so as to enable adjustment of a current density of the coagulation current between electrode (10) and tissue.
4. Apparatus according to one of the preceding claims, in particular according to Claim 3, characterized in that the control device (3) is designed so that the current density can be adjusted independently of the state of expansion.
- 30 5. Apparatus according to one of the preceding claims, characterized in that measurement devices (4) are provided for detecting the state of expansion of the body (10, 14).
- 35 6. Apparatus according to one of the preceding claims, characterized in that the electrode comprises a

treatment electrode (10) that is at least partially  
permeable to liquid and can be brought into contact with  
a section of the tissue, as well as a supply device (20)  
for liquid through which an electrically conductive  
5 liquid can be delivered to the treatment electrode (10),  
and a current supply device (30, 31) to deliver the HF  
coagulation current to the treatment electrode (10) in  
such a way that the HF treatment current can be  
conducted to the liquid that is passing through the  
10 treatment electrode (10).

7. Apparatus according to one of the preceding claims, in particular according to Claim 6, characterized in that the treatment electrode (10) comprises an elastically stretchable or unfoldable surface element (11) on the inside (12) of which, i.e. the side opposite the tissue, there is disposed an interior space (13) to which an internal pressure can be applied so that the surface element (11) can be expanded by increasing the internal pressure.  
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8. Apparatus according to one of the preceding claims, in particular according to Claim 7, characterized in that the surface element (11) is shaped like a ring or a sphere.  
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9. Apparatus according to one of the preceding claims, in particular according to one of the claims 6 - 8, characterized in that the treatment electrode (10, 10') is constructed in the shape of a balloon catheter.  
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10. Apparatus according to one of the preceding claims, in particular according to one of the claims 7 - 9, characterized in that the interior space (13) can be filled with the electrically conductive liquid.  
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11. Apparatus according to one of the preceding claims, in particular according to one of the claims 6 - 10, characterized in that the electrically conductive liquid comprises polyvinyl pyrrolidone (PVP), a surfactant or a similar means of changing the viscosity of the electrically conductive liquid.  
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12. Apparatus according to one of the preceding claims, in particular according to one of the claims 6 - 11, characterized in that the treatment electrode (10, 10') comprises a film, a felt or a woven fabric and preferably is made of a thermally stable material, in particular a tetrafluoroethylene material.  
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13. Apparatus according to one of the preceding claims, in particular according to one of the claims 7 - 12, characterized in that the interior space (13) comprises an expandable auxiliary body (14) that is hydraulically separated from the electrically conductive liquid, the surface element (11) preferably being constructed in several layers so that in an inner layer (15) liquid can be conducted in the surface direction while in an outer layer (16) liquid can be conducted perpendicular to the surface direction, and preferably between the inner layer (15) and the outer layer (16) a partition layer (17) with a greater resistance to flow is disposed.  
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14. Apparatus according to one of the preceding claims, characterized by a suction device (22, 23) to suck away (excess) liquid.  
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15. Apparatus according to one of the preceding claims, characterized in that the electrode (10) is constructed so that a cutting current can be applied to it.